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Message Text

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L-03 NSAE-00 NSC-05 OMB-01 PM-04 USIA-15 OES-06
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P 230006Z MAR 77
FM AMEMBASSY OTTAWA
TO SECSTATE WASHDC PRIORITY 2874
INFO AMCONSUL CALGARY
AMCONSUL HALIFAX
AMCONSUL MONTREAL
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C O R R E C T E D C O P Y FOR TEXT PARA FIVE

PASS WHITE HOUSE/SCHLESINGER, FEA AND EPC

E.O. 11652: N/A
TAGS: ENRG, CA
SUBJECT: ENERGY: DEPARTMENT OF ENERGY MINES AND RESOURCES
(EMR) ESTIMATE OF CANADA'S OIL AND
NATURAL GAS RESOURCES

1. BEGIN SUMMARY: TWO PART STUDY PUBLISHED BY EMR MARCH 17 INDICATES THAT THE LIKELIHOOD OF FRONTIER CRUDE OIL RESOURCES EXCEEDING THOSE OF WESTERN CANADA, EVEN TOTALING ALL BASINS, IS LOW. PROSPECTS FOR NATURAL GAS ARE CONSIDERABLEY BETTER; HOWEVER, THE PROBABILITY OF A SINGLE BASIN APPROACHING THE POTENTIAL OF WESTERN CANADA IS LESS THAN 10 PERCENT. CANADA'S FRONTIER
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REGIONS THUS OFFER ONLY MODEST TO MODERATE PROSPECTS FOR ADDITIONAL CRUDE OIL AND NATURAL GAS DISCOVERIES. THIS CONTRASTS WITH EARLIER INDUSTRY FORECASTS CITING THESE AREAS AS LIKELY SOURCES OF ABUNDANT AND RELATIVELY CHEAP CONVENTIONAL FUELS. (EMBASSY COMMENT: STUDY IS ESSENTIALLY A TECHNICAL DOCUMENT SO IT IS NOT CLEAR AT PRESENT HOW ITS FINDINGS WILL INFLUENCE GOC DOMESTIC

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ENERGY POLICY OR EXPORT POLICY. HOWEVER, SINCE STUDY PRESENTS A MORE PESSIMISTIC REVISION OF RESERVES PICTURE, IT COULD HAVE IMPACT ON EXPORT POLICY.)

2. STUDY ESTIMATES THAT CANADA'S REMAINING RECOVERABLE RESERVES OF CRUDE OIL AND NATURAL GAS LIQUIDS, EXCLUDING OIL SANDS, BUT INCLUDING LLOYDMINSTER HEAVY OIL DEPOSITS, ARE 8.5 BILLION BARRELS (AS OF DECEMBER 31, 1975). IT IS 90 PERCENT PROBABLE THAT UP TO 25 BILLION BARRELS OF CRUDE OIL AND OTHER LIQUID HYDROCARBONS EXIST--AGAIN EXCLUDING OIL SANDS. THERE IS 50 PERCENT PROBABILITY THAT ABOUT 30 BILLION BARRELS EXIST AND 10 PERCENT PROBABILITY THAT UP TO 43 BILLION BARRELS EXIST.

3. REMAINING DISCOVERED RESERVES OF NATURAL GAS, INCLUDING GAS FOUND TO DATE IN FRONTIER AREAS, ARE ABOUT 85 TRILLION CUBIC FEET (TCF). IF POTENTIAL BUT UNDISCOVERED GAS IS INCLUDED, THERE IS 90 PERCENT PROBABILITY THAT MORE THAN 229 TCF EXIST. THERE IS 50 PERCENT PROBABILITY THAT MORE THAN 277 TCF EXIST AND 10 PERCENT PROBABILITY THAT MORE THAN 378 TCF EXIST, ABOUT TWO-THIRDS OF WHICH MIGHT BE FOUND IN FRONTIER AREAS.

4. STUDY INDICATES OIL SANDS AND HEAVY OIL DEPOSITS COULD YIELD BETWEEN 80 AND 200 BILLION BARRELS OF RECOVERABLE, UPGRADED OIL; BUT THIS RESOURCE, CANADA'S LARGEST KNOWN SOURCE OF ENERGY, HAS FAILED TO LIVE UP TO ITS PAST PROMISE DUE TO MAJOR TECHNICAL AND ECONOMIC PROBLEMS. FOLLOWING PARAGRAPHS OUTLINE IN GREATER UNCLASSIFIED

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DETAIL MAIN FINDINGS OF EMR STUDY. END SUMMARY.

5. CONVENTIONAL OIL AND NATURAL GAS

A. EMR HAS RECENTLY COMPLETED GEOLOGICAL APPRAISAL OF CANADA'S POTENTIAL OIL AND GAS RESOURCES, SUMMARY RESULTS OF WHICH ARE PRESENTED IN TABLE BELOW. SINGLE UNIQUE VALUES FOR CANADA'S OIL AND GAS POTENTIAL ARE NOT PRESENTED; THE APPRAISAL PROVIDES ESTIMATES OF THE RANGE OF PROBABLE OCCURRENCE OF OIL AND GAS RESOURCES WITHIN EACH SEDIMENTARY (HYDROCARBON-BEARING) BASIN. (THE TERM RESOURCE, AS EMPLOYED THROUGHOUT THE REPORT, INCLUDES REMAINING RECOVERABLE RESERVES AND POTENTIAL OR UNDISCOVERED OIL AND GAS.)

	LIKELIHOOD OF EXISTENCE		
	HIGH	50/50 CHANCE	LOW
	90 PCT	50 PCT	10 PCT
	PROBABILITY	PROBABILITY	PROBABILITY

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OIL RESOURCES
(BILLIONS OF BARRELS)

REGION			
ATLANTIC SHELF SOUTH	1.2	1.9	3.0
LABRADOR-EAST NEW-FOUNDLAND SHELF	1.7	2.6	4.5
NORTHERN STABLE PLATFORM BASINS	0.01	0.6	3.2
ST.LAWRENCE LOWLANDS	0.04	0.09	0.2

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C O R R E C T E D C O P Y - (TEXT - AFTER LINE EIGHT)

WESTERN CANADA	10.9	11.7	13.5
MAINLAND TERRITORIES	0.3	0.5	1.0
MACKENZIE DELTA-			

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BEAUFORT SEA	4.3	6.9	12
SVERDRUP BASIN	1.1	2.0	4.0
ARCTIC FOLD BELTS	0.5	1.8	4.3
TOTAL CANADA (ACCESSIBLE REGIONS)	25	30	43

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REGION	GAS RESOURCES (TRILLION OF CUBIC FEET)		
ATLANTIC SHELF SOUTH	8.6	13.2	20
LABRADOR-EAST NEWFOUND-LAND SHELF	18	26.7	45
NORTHERN STABLE PLATFORM BASINS	0.4	2.3	12
ST. LAWRENCE LOWLANDS	0.7	1.4	3.2
WESTERN CANADA	89	97	107
MAINLAND TERRITORIES	6.0	9.7	20
MACKENZIE DELTA-BEAUFORT SEA	39	60	99
SVERDRUP BASIN	21	40	80
ARCTIC FOLD BELTS	2.9	11	26
TOTAL CANADA (ACCESSIBLE REGIONS)	229	277	378

NOTE: COLUMNS DO NOT TOTAL ARITHMETICALLY TO CANADA TOTALS BECAUSE INDIVIDUAL CURVES MUST BE SUMMED USING A STATISTICAL TECHNIQUE DESCRIBED IN FULL REPORT.

B. AN ECONOMIC ASSESSMENT OF THESE RESOURCES WILL BE PUBLISHED BY EMR EARLY IN 1977. IT WILL PROVIDE ESTIMATES OF THE COSTS AT WHICH THESE ENERGY RESOURCES, CANADA'S POSSIBLE FUTURE OIL AND GAS SUPPLIES, MIGHT BECOME AVAILABLE. (NOTE: EMBASSY WILL REPORT ON THIS
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WHEN PUBLISHED.)

C. AS OF YEAR END 1975, ABOUT 85 TRILLION CUBIC FEET (TCF) OF GAS HAD BEEN DISCOVERED IN WESTERN CANADA OF WHICH 26 TCF HAD BEEN PRODUCED LEAVING 59 TCF REMAINING RESERVES. AT THE 100 PERCENT PROBABILITY LEVEL THERE IS UP TO 25 TCF OF DISCOVERED NATURAL GAS IN CANADA'S FRONTIER REGIONS.

D. SIMILARLY, AT YEAR END 1975 ABOUT 16.4 BILLION BARRELS OF RECOVERABLE CRUDE OIL AND NATURAL GAS LIQUIDS HAD BEEN DISCOVERED IN WESTERN CANADA OF WHICH 8.4 BILLION BARRELS HAD BEEN PRODUCED, LEAVING 8.0 BILLION BARRELS REMAINING RESERVES. AT 100 PERCENT PROBABILITY LEVEL ONLY A FEW HUNDRED MILLION BARRELS OF CRUDE OIL AND NATURAL GAS LIQUIDS ARE KNOWN TO EXIST IN THE FRONTIER REGIONS; 8.5 BILLION BARRELS AT 100 PERCENT PROBABILITY LEVEL CONSTITUTE THE REMAINING LIQUID HYDROCARBON RESOURCE FOR ALL OF CANADA.

E. IN ADDITION TO THESE KNOWN RESOURCES THERE IS "HIGH" (90 PERCENT) PROBABILITY THAT ABOUT 16 MILLION BARRELS OF COMBINED CRUDE OIL AND NATURAL GAS LIQUIDS REMAIN TO BE DISCOVERED AND "LOW" (10 PERCENT) PROBABILITY THAT ABOUT 34 BILLION BARRELS MAY BE DISCOVERED; ABOUT FOUR-FIFTHS OF WHICH WILL BE FOUND IN FRONTIER AREAS. FOR NATURAL GAS, BETWEEN 145 AND 294 TCF REMAIN TO BE DISCOVERED AT "HIGH" AND "LOW" PROBABILITY LEVELS RESPECTIVELY, ABOUT NINE TENTHS OF WHICH WILL BE FOUND IN FRONTIER AREAS.

F. USING AN APPROXIMATE THERMAL EQUIVALENT OF 6,000 CUBIC FEET OF NATURAL GAS PER BARREL OF OIL, ESTIMATES IN TABLE ABOVE INDICATE THAT CANADA'S REMAINING OIL AND

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P 230006Z MAR 77
FM AMEMBASSY OTTAWA
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INFO AMCONSUL CALGARY
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GAS POTENTIAL IS EXPECTED TO BE DOMINANTLY GAS. TABLE FURTHER INDICATES THAT LIKELIHOOD OF FRONTIER CRUDE OIL RESOURCES EXCEEDING THOSE OF WESTERN CANADA, EVEN TOTALLING ALL BASINS, IS LOW. PROSPECTS FOR NATURAL GAS ARE CONSIDERABLY BETTER; HOWEVER, PROBABILITY OF A SINGLE BASIN APPROACHING POTENTIAL OF WESTERN CANADA, ALTHOUGH REAL, IS LESS THAN 10 PERCENT.

G. STUDY EMPHASIZES THAT ESTIMATED VALUES OF OIL AND GAS POTENTIAL, DESCRIBED IN TERMS OF PROBABILITY, MUST NOT BE REGARDED AS RESERVES. MOST EMPHATICALLY, ESTIMATES SHOULD NOT BE REGARDED AS ASSURED SUPPLIES. AT TIME OF ESTIMATION FOR FRONTIER REGIONS, ONLY SMALL PORTION OF RESOURCES WERE IN DISCOVERED CATEGORY. FURTHER, DEPENDING UPON LOCATION, CLIMATE AND ENVIRON-MENT CONSTRAINTS EXISTING IN EACH AREA, DISCOVERED RESOURCES MAY FALL SHORT OF THRESHOLD VOLUME REQUIRED
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TO JUSTIFY CONSTRUCTION OF REQUIRED TRANSPORTATION SYSTEMS. FINALLY, POOL SIZE, WELL PRODUCTIVITIES AND OTHER FACTORS AFFECTING DEVELOPMENT COSTS MAY BE SUCH AS TO PRECLUDE ECONOMIC DEVELOPMENT OF MANY OF FIELDS AT REASONABLE PRICE LEVELS.

H. HIGHLIGHTS OF THE OIL AND GAS ESTIMATES OF THIS REPORT ARE:

1. BULK OF HYDROCARBON POTENTIAL (MAINLY GAS) LIES IN THREE FRONTIER REGIONS, MACKENZIE DELTA-BEAUFORT SEA, ARCTIC ISLANDS AND LABRADOR SHELF REGIONS WHICH ARE EXPENSIVE AND DIFFICULT TO EXPLORE. ADDITIONS TO SHORT-TERM SUPPLY WILL HAVE TO COME LARGELY FROM WESTERN CANADA SEDIMENTARY BASIN.

2. FOR FRONTIER REGIONS, BULK OF POTENTIAL IS LIKELY

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TO OCCUR IN OFFSHORE AREAS WITH VERY HOSTILE ENVIRON-
MENTS AND ATTENDANT HIGH COSTS, LOGISTICAL PROBLEMS,
AND ENVIRONMENTAL RISKS. THIS POTENTIAL IS CONSIDERED
UNLIKELY TO ADD MATERIALLY TO SHORT- AND MEDIUM-TERM
SUPPLY.

3. SIGNIFICANT UNDISCOVERED RESOURCES REMAIN IN THE
WESTERN CANADA SEDIMENTARY BASIN. THESE WILL OCCUR
MOSTLY IN THE DEEPER PART OF THE BASIN, AND IN LOW
PRODUCTIVITY GAS SANDS, AND IN HEAVY OILS IN THE
SHALLOWER PART OF BASIN.
4. MACKENZIE DELTA-BEAUFORT SEA AREA IS AN ABOVE-AVERAGE
PROSPECTIVE PETROLEUM REGION. LARGEST PART OF THE
POTENTIAL IN THIS AREA IS PROBABLY IN OFFSHORE REGION.
SIGNIFICANT VOLUMES OF GAS HAVE ALREADY BEEN ESTABLISHED
IN MACKENZIE DELTA AND THERE ARE INDICATIONS THAT THERE
MAY ALSO BE LARGE QUANTITIES OF LIQUID
HYDROCARBONS.
5. LARGE POTENTIAL FOR GAS EXISTS IN SVERDRUP BASIN
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AND IN ARCTIC FOLD BELTS OF ARCTIC ISLANDS. LARGEST
PART OF THIS POTENTIAL IS ALSO IN THE OFFSHORE REGION.
6. MAJOR PORTION OF PETROLEUM POTENTIAL ON EASTERN
SEABOARD LIES BENEATH LABRADOR SHELF.

I. ESTIMATES OF BOTH OIL AND GAS RESOURCES FOR CANADA
HAVE DECREASED SUBSTANTIALLY FROM LAST EMR ESTIMATES
PUBLISHED IN 1973. ONE OF MAJOR REASONS FOR REDUCTION
IS THAT CURRENT ESTIMATES EXCLUDE AREAS CONSIDERED TO
BE INACCESSIBLE USING KNOWN TECHNOLOGY WHEREAS 1973
ESTIMATES INCLUDED AREAS SUCH AS CONTINENTAL SLOPES AND
RISES AND ARCTIC COASTAL PLAIN OFFSHORE. THIS EXCLUSION
IS RESPONSIBLE FOR APPROXIMATELY ONE THIRD OF REDUCTION
FROM PREVIOUS ESTIMATES. SIGNIFICANTLY HOWEVER,
DECREASE ALSO RESULTS FROM NEW AND PREDOMINANTLY DIS-
APPOINTING FLOW OF INFORMATION THAT HAS BEEN GENERATED
BY EXPLORATION IN INTERIM PERIOD. CERTAIN OF CHANGES
IN ESTIMATES HAVE RESULTED FROM INCREASED CAPABILITY
TO PROCESS INFORMATION AND IMPROVEMENTS IN METHODOLOGY.
6. OIL SANDS DEPOSITS OF ALBERTA
A. OIL SANDS OF ALBERTA REPRESENT LARGEST LOCALIZED
ACCUMULATION OF PETROLEUM IN WORLD. THEY INCLUDE
BITUMINOUS SANDS DEPOSITS AT ATHABASCA, PEACE RIVER,
WABASCA AND BUFFALO HEAD HILLS AND HEAVY OIL DEPOSITS
AT COLD LAKE, ALL IN ALBERTA. HOWEVER, LARGE PART OF
THIS RESOURCE IS NOT RECOVERABLE USING KNOWN TECHNOLOGY
AND OF THE PART THAT IS RECOVERABLE, ONLY A FRACTION IS
LIKELY TO BECOME AVAILABLE UNDER CURRENT AND PROJECTED
ECONOMIC CONDITIONS. IF IT IS ASSUMED THAT MINING

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TECHNIQUES MAY BE ONLY MARGINALLY ECONOMIC THEN ONLY

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THOSE DEPOSITS LYING BENEATH 50 FEET OR LESS OF OVER-
BURDEN MIGHT BE CONSIDERED AS ECONOMICALLY RECOVERABLE
RESERVES. THIS AMOUNTS TO ABOUT 7 BILLION STOCKTANK
BARRELS OF SYNTHETIC CRUDE OF WHICH EXISTING GREAT
CANADIAN OIL SANDS AND SYNCRUDE PROJECT UNDER CONSTRUCTION
ARE EXPECTED TO YIELD BETWEEN 1.5 AND 2 BILLION BARRELS
DURING A PROJECTED 25-YEAR PERIOD OF PRODUCTION.

B. IN 1974 ALBERTA ENERGY RESOURCES CONSERVATION BOARD
ESTIMATED POTENTIAL ULTIMATE RECOVERABLE RESOURCES FOR
THE WHOLE REGION OF SOME 250 BILLION BARRELS OF SYN-
THETIC CRUDE ON BASIS OF POTENTIAL RECOVERY TECHNIQUES
AND DEPOSIT CHARACTERISTICS. AT PRESENT, ONLY SMALL
PORTION OF OUTCROPPING AND SHALLOW DEPOSITS ARE BEING
EXPLOITED ON A COMMERCIAL SCALE, AND REMAINING
ESTIMATED RESOURCES OF CRUDE BITUMEN FROM THIS SOURCE
ARE CONSIDERED BY ALBERTA BOARD TO COMPRISE ABOUT
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27 BILLION BARRELS OF SYNTHETIC CRUDE. REMAINDER (ABOUT 223 BILLION BARRELS) MUST BE RECOVERED BY IN SITU TECHNIQUES, AND ALTHOUGH EXTENSIVE TESTS HAVE BEEN CONDUCTED, NO FULL-SCALE COMMERCIAL PRODUCTION BY THIS METHOD HAS YET BEEN REALIZED FROM ANY OF ALBERTA DEPOSITS.

C. DATA ABOVE REPRESENTS CANADA'S OVERALL OIL AND GAS RESOURCE ENDOWMENT AS OF YEAR END 1975. EMR ALSO PUBLISHED INTERPRETIVE COMPANION REPORT WHICH ADDRESSES TECHNICAL AND ECONOMIC PROBLEMS ENTAILED IN POSSIBLE FUTURE EFFORTS TO DEVELOP CANADA'S OIL SANDS AND HEAVY OIL DEPOSITS.

7. EMBASSY WILL FORWARD BOTH DOCUMENTS TO DEPARTMENT BY AIRGRAM. ENDERS

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Message Attributes

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Secure: OPEN
Status: NATIVE
Subject: ENERGY: DEPARTMENT OF ENERGY MINES AND RESOURCES (EMR) ESTIMATE OF CANADA\'S OIL AND NATURAL GAS RESOURCES
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To: STATE
Type: TE
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